REMARKS

Claims 1, 2, and 4-14 are pending in the subject application. By an election, claim 3 has been withdrawn from prosecution. Claims 1, 2, and 4-14 stand rejected under 35 U.S.C. 103(a). More specifically, the Examiner has rejected claims 1, 2, and claims 4-6 under 35 U.S.C. §103(a) as being unpatenable over U.S. Patent Number 5,872,611 to Hirata, et al. ("Hirata" or the "Hirata Reference") in view of U.S. Patent Number 6,256,080 to Colgan ("Colgan" or the "Colgan Reference") or vice versa; and claims 7-14 under 35 U.S.C. §103(a) as being unpatenable over Hirata and Colgan further in view of U.S. Patent Number 6,313,898 to Numano, et al. ("Numano" or the "Numano Reference") or, alternatively, as being unpatentable over Colgan and Hirata, further in view of Numano. The Applicants respectfully traverse these grounds for rejection.

The Applicants appreciate the Examiner's thorough examination of the subject application. The Applicants respectfully request reconsideration of the subject application based on the following remarks.

ISSUES

1. Whether claims 1, 2, and claims 4-6 would have been obvious to one of ordinary skill in the art at the time this invention was made, and therefore unpatentable within the meaning of 35 U.S.C. §103(a), over U.S. Patent No. 5,872,611 to Hirata in view of U.S. Patent No. 6,256,080 to Colgan or vice versa.

2. Whether claims 7-17 would have been obvious to one of ordinary skill in the art at the time this invention was made, and therefore unpatentable within the meaning of 35 U.S.C. §103(a), over Hirata in view of Colgan, further in view of U.S. Patent No. 6,313,898 to Numano or, alternatively over Colgan in view of Hirata further in view of Numano.

ARGUMENTS

ISSUE 1

In his rejection of claims 1, 2, and claims 4-6 mentioned above under 35 U.S.C. §103(a), the Examiner relies on Hirata for purportedly disclosing an LCD apparatus comprising a pair of opposing substrates, an LC layer interposed between the opposing substrates, at least one electrode provided on each of the opposing substrates for applying an electric field across the LC layer, and at least one volume excluding member. Detailed Action dated October 5, 2004, page 2. Furthermore, the Examiner relies on Hirata for purportedly disclosing that at least one volume excluding member is provided on at least one of the pair of substrates and that the volume excluding member is on at least a portion of one side edge of the at least one electrode. Id., page 3. Finally, the Examiner relies on Hirata for purportedly disclosing that, when a voltage is applied to the at least one electrode, the LC molecules are titled in a uniform direction from the at least one side edge of the at least one electrode to an opposite edge. Id., page 4. The Examiner concedes that, Hirata teaches a positive dielectric anisotropy and admits that, Hirata does not explicitly disclose an LC layer having a negative dielectric anisotropy or that a side of each of the pair of substrates is subjected to a vertical alignment treatment or a vertical alignment ("VA") mode of operation. Id.

The Examiner, however, relies on Colgan for purportedly disclosing the use of negative dielectric anisotropy, concluding that one skilled in the pertinent art

> would find the reason, suggestion, or motivation to add a liquid crystal layer containing liquid crystal molecules having a negative dielectric anisotropy and a side of each of the pair of substrates facing the liquid crystal layer subjected to vertical alignment treatment to comprise a display with improved wide viewing angle.

Id., page 5.

Alternatively, the Examiner relies on Colgan for purportedly disclosing an LCD apparatus comprising a pair of opposing substrates, an LC layer interposed between the opposing substrates, at least one electrode provided on each of the opposing substrates for applying an electric field across the LC layer, and at least one volume excluding member. See, e.g., Detailed Action dated October 5, 2004, page 12. Furthermore, the Examiner relies on Colgan for purportedly disclosing that at least one volume excluding member is provided on at least one of the pair of substrates and that the volume excluding member is on at least a portion of one side edge of the at least one electrode. See, e.g., Id., page 12. Finally, the Examiner relies on Colgan for purportedly disclosing an LC layer having a negative dielectric anisotropy or that a side of each of the pair of substrates is subjected to a vertical alignment treatment or a VA mode of operation.

The Examiner concedes that, Colgan does not explicitly disclose at least one volume excluding member that is provided on at least a portion of one side edge of at least one of the electrodes on one of the substrates. See, e.g., Id., page 13. Moreover, the Examiner admits that, Colgan does not disclose that the LC molecules are tilted in a uniform direction from the at least one side edge to an opposite edge. However, the Examiner relies on Hirata to disclose the missing attributes of Colgan. Specifically, the Examiner relies on Hirata for purportedly disclosing that, when a voltage is applied to the at least one electrode, the LC molecules are titled in a uniform direction from the at least one side edge of the at least one electrode to an opposite edge. See, e.g., Id., page 13.

In *Graham v. John Deere Co.*, 383 U.S. 1 (1966), the U.S. Supreme Court fashioned a three-part test of obviousness:

(1) determine the scope and content of the prior art;

(2) ascertain the differences between the prior art and the claims at issue; and

(3) resolve the level of ordinary skill in the pertinent art.

Additionally, the Court of Appeals for the Federal Circuit (the "Federal Circuit") and the Manual of Patent Examination Practice (8th Edition) (the "MPEP") have established that a *prima*

facie case of obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See, e.g., *In re Lee,* 277 F.3d 1338 (Fed. Cir. 2002); MPEP § 2143.01. The MPEP further requires that there must be a reasonable expectation of success and that the prior art references must teach or suggest all of the claim limitations. See, e.g., *In re Merck & Co., Inc.*, 800 F.2d 1091 (Fed. Cir. 1986).

Applying the first prong of the *Graham* test:

The Hirata reference discloses an LCD device having two or more different spacings between the opposing substrates. See, e.g., Hirata, Abstract. More particularly, the Hirata reference discloses a twisted nemetic ("TN") LCD device having two or more different spacings between opposing substrates to address the birefringence phenomenon and, thereby, improve viewing angle characteristics. Conventionally, TN molecules are pre-tilted "to prevent the occurrence of disclination lines". See, e.g., Id., col. 2, lines 22-29. The orientation of LC molecules relative to the surface is substantially constant, i.e., parallel, during device operation. However, when voltage across the LC molecules is increased, the LC molecules rotate or twist, like the hands of a clock. That is, the liquid crystalline molecules rotate along a (roughly vertical) helical axis under the influence of an applied field so as to switch between a twisted and untwisted orientation while maintaining an alignment relative to the surface of a small angle δ, i.e. roughly horizontal. Birefringence (refractive index anisotropy), typically, occurs as a result of the varying contrast due to the angle at which the viewer observes the screen of the LCD device. See, e.g., Id., col. 1, lines 56-60.

As shown in Hirata FIGs. 3 and 4, when, as voltage is increased, the viewing angle shifts from directly above the LCD screen, e.g., in a positive ($\theta 1$) or negative ($\theta 2$) direction, light transmittance can actually increase at some point when viewing from the positive direction due to an "inversion phenomenon" or changes in light transmittance may be slight when viewing

from a negative direction, respectively. See, e.g., Id., col. 2, line 61 to col. 3, line 12. Thus, Hirata teaches an LCD device "to improve the viewing angle characteristic peculiar to such TN liquid crystal displays". Id., col. 3, lines 43-44. Thus, Hirata's teachings are **expressly limited to a phenomenon that is unique or "peculiar to" TN LCDs** and are **for the purpose of improving viewing angle characteristics**.

The Examiner alleges that, Hirata Examples 10 and 11 are relevant to the patentability of the present invention. Example 10 (and FIGs. 22 and 23) provides a TN LCD device having a slit-like opening 48 formed in the counter electrode 45. According to the specification, the pre-tilt angle of the TN LC material is 0°, i.e., the LC material is initially oriented horizontally. See, e.g., Id., col. 19, lines 4-8. When an electric field is applied to the LC material, the LC molecules aligned in the negative direction are substantially perpendicular to the LC molecules aligned in the positive direction. Indeed, "[t]hus, within the same pixel region, different regions are formed where the liquid crystal molecules are caused to line up in opposite directions." Id., col. 19, lines 14-16.

Accordingly, Hirata expressly teaches that, the LC molecules **are** [1] **tilted in a non-uniform direction** [2] **towards the volume excluding member** when a voltage is applied to the electrode. Moreover, Hirata teaches that the slit-like openings 48 "may result in the formation of disclination lines due to disturbed orientation of the liquid crystal molecules", recommending use of a light blocking film. See, Id., col. 19, lines 39-41 (emphasis added).

Hirata Example 11 (and FIG. 27) provides a TN LCD device having a low-permittivity insulating film 47 formed in the counter electrode 45. The insulating film 47 weakens the electric field and the LC molecules line up in opposite directions within one pixel. Consequently, Hirata again expressly teaches that, the LC molecules **are** [1] **tilted in a non-uniform direction** [2] **towards the volume excluding member** when a voltage is applied to the electrode. Moreover, Hirata again teaches that the insulating film 47 may result in the formation of disclination lines due to disturbed orientation of the liquid crystal molecules, again recommending use of a light blocking film. See, Id., col. 20, line 66 to col. 21, line 2.

In summary, Hirata discloses means and methods for improving the viewing angle phenomenon and, more specifically, to improving the viewing angle phenomenon "peculiar to" twisted nematic, positive dielectric anisotropic LCDs. Moreover, Hirata teaches forming slit-like openings, which, when an electric filed is applied to the LC molecules cause the molecules to tilt in a non-uniform direction towards the openings, which it admits may cause disclination lines. Accordingly, in comparison with the invention as claimed, Hirata addresses **a non-analogous problem for a peculiar LCD device** and **expressly teaches away from providing a uniform orientation of LC molecules that is away from the volume excluding member**.

The Colgan reference discloses an LCD device that includes a ridge or trench that is formed in the pixel area. See, e.g., Colgan, Abstract. More specifically, the Colgan reference discloses an LCD device that includes a ridge or trench, which is self-aligned with the portions of light-absorbant material in the pixel area, in which the **ridge or trench merely provides pre-tilt control to the LC materials**. See, e.g., Id., col. 7, lines 15-17; col. 7, lines 40-43; and col. 7, lines 64-67.

Similar to Hirata, Colgan purportedly primarily **provides a solution to the viewing angle phenomenon**. See, e.g., Id., col. 1, lines 25-28; col. 15, lines 41-50. Furthermore, Colgan addresses the **degradation of the display contrast ration due to light leakage** around the ridge. See, e.g., col. 4, lines 20-22; col. 8, lines 24-29; col. 9, lines 43-46.

Colgan discloses forming at least one thin wall, or ridge, on a pixel (or other) electrode. The ridge provides

> a liquid crystal pretilt that combines with the lateral electric field from the edges of the pixel electrode 26 defining the LC cell to cause the LC molecules to tilt in a desired direction when a voltage is applied to across the pixel. By providing such tilt control, conventional rubbing steps associated with alignment layers can be avoided.

Id., col. 3, lines 43-49 (emphasis added); Cf. Id., col. 4, lines 1-12. Thus, Colgan teaches forming a ridge to avoid a rubbing step during the manufacturing process, i.e., so that the

substrates **do not have to be "subjected to a vertical alignment treatment"**. Colgan **does not teach, mention or disclose forming a ridge (or trench) to address disclination.**

Referring to FIGs. 5 and 6, the pre-tilt caused by the ridges would cause the LC molecules to orient in the direction of the slope of the ridge or trench. Accordingly, between two ridges (or the walls of a trench) the **LC molecules would be pre-tilted non-uniformly**. Moreover, the **pre-tilting is towards the ridge not away from the ridge**.

In summary, Colgan discloses means and methods for improving the viewing angle phenomenon and, more specifically, to **improving the viewing angle phenomenon by minimizing light leakage**. Moreover, Colgan teaches forming trenches or ridges, which, when an electric filed is applied to the LC molecules **cause the molecules to pre-tilt in a non-uniform direction towards the sides of the ridges (walls of the trenches)**. The express purpose of this is to avoid subjecting the substrates **to a vertical alignment treatment"**. Colgan never once mentions disclination. Accordingly, in comparison with the invention as claimed, Colgan also addresses **a non-analogous problem** and **expressly teaches away from providing a uniform orientation of LC molecules that is away from the volume excluding member**.

CLAIMS 1 AND 4 ARE NOT MADE OBVIOUS BY THE HIRATA AND COLGAN REFERENCES BECAUSE NEITHER REFERENCE TEACHES, MENTIONS OR SUGGESTS THAT THE LIQUID CRYSTAL MOLECULES ARE TILTED IN A UNIFORM DIRECTION FROM THE VOLUME EXCLUDING MEMBER DISPOSED ON A PORTION OF THE SIDE EDGE OF AN ELECTRODE TO AN OPPOSITE EDGE.

As provided in our discussion above, the Hirata reference teaches forming slit-like openings, which, when an electric field is applied to the LC molecules, cause the LC molecules to tilt in a **non-uniform** direction **towards** the openings. Accordingly, Hirata expressly teaches away from providing a **uniform orientation** of LC molecules that is **away from** the volume excluding member. Similarly, Colgan teaches forming trenches or ridges, which, when an electric field is applied to the LC molecules, cause the LC molecules to pre-tilt in a **non-uniform** direction **towards** the sides of the ridges (walls of the trenches). Accordingly, Colgan also

expressly teaches away from providing a **uniform orientation** of LC molecules that is **away from** the volume excluding member.

Accordingly, two differences between the present invention and the prior art are immediately apparent. First, both the Hirata and Colgan references teach "volume excluding members" that cause LC molecules to pre-tilt **non-uniformly**, i.e., in opposite directions. Second, both the Hirata and Colgan references teach "volume excluding members" that cause LC molecules to pre-tilt **towards** rather than away from the "volume excluding member".

Consequently, neither reference relied on by the Examiner teaches, mentions or suggests an element of claims 1 and 4 nor has the Examiner cited any reference that teaches, mentions or suggests a "volume excluding member" that causes LC molecules to tilt in a uniform direction from the volume excluding member.

Nor would such a feature be obvious to one of ordinary skill in the art. Indeed, the Examiner has not cited any prior art that teaches, mentions or suggests a "volume excluding member" that causes LC molecules to tilt in a uniform direction from the volume excluding member. Therefore, the Examiner has failed to satisfy the second and third prongs of the *Graham* test and claims 1 and 4 and all claims depending therefrom are not obvious or unpatentable over Hirata in view of Colgan, or *vice versa.*

Because claim 2 and claims 5 and 6 depend from claims 1 and 4, respectively, they also are not made obvious by the Hirata and Colgan references.

CLAIMS 1 AND 4 ARE NOT MADE OBVIOUS BY THE HIRATA AND COLGAN REFERENCES BECAUSE THE TEACHINGS OF THE REFERENCES ARE SUCH THAT ONE SKILLED IN THE ART WOULD NOT HAVE COMBINED THE REFERENCES TO SOLVE THE PROBLEM ADDRESSED BY THE PRESENT INVENTION.

Even if, *arguendo*, the Hirata and Colgan references teach all of the elements of claims 1 and 4, the Examiner has failed to make *a prima facie* case of obviousness because neither reference contains a teaching, suggestion or motivation to combine or modify the teachings of one with the other. As provided in MPEP § 2143.01, a *prima facie* case of obviousness can only be established by modifying the teachings or combining the prior art to produce the claimed invention where there is some teaching, suggestion or motivation to modify the teachings or combine prior art references found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. *In re Fine*, 837 F. 2d 1071 (Fed. Cir. 1988). The references cited by the Examiner, alone and in combination, include no such teaching, suggestion or motivation.

Furthermore, as provided by the Federal Circuit, a 35 U.S.C. § 103(a) rejection based upon a modification of a reference that destroys the intent, purpose or function of the invention disclosed in a reference, is not proper and the *prima facie* case of obviousness cannot be properly made. In short there would be no technological motivation for engaging in the modification or change. To the contrary, there would be a disincentive. *In re Gordon*, 733 F. 2d 900, 221 USPQ 1125 (Fed. Cir. 1984). In the present case it is clear that if the cited reference were modified in the manner suggested by the Examiner it would destroy the intent, purpose or function of the device as taught by the reference.

The devices disclosed by Hirata and Colgan operate on completely different physical principles and address solutions to non-analogous problems. Hirata's teachings are expressly limited to a phenomenon that is unique or "peculiar to" twisted nematic LCDs and are for the purpose of improving the viewing angle characteristics. Although not narrowly restricted to twisted nematic LCDs, the Colgan reference addresses the viewing angle phenomenon. In contrast, the present invention addresses problems associated with disclination and, more specifically, contrast problems that occur when the negative dielectric anisotropy LC molecules are not perfectly vertical in its initial, i.e., no voltage, state.

According to Hirata, the LC material is initially oriented horizontally, i.e., has a positive dielectric anisotropy, such that, when an electric field is applied to the LC material, the LC molecules initially aligned in the negative direction are substantially perpendicular to the LC molecules aligned in the positive direction. Thus, Hirata expressly teaches that, the LC molecules **are** [1] **tilted in a non-uniform direction** [2] **towards the volume excluding member** when a voltage is applied to the electrode. Moreover, Hirata teaches that the slit-like openings 48 "may result in the formation of disclination lines due to disturbed orientation of the liquid crystal molecules", recommending use of a light blocking film. See, Id., col. 19, lines 39-41 (emphasis added).

Reliance on Hirata to make the invention as claimed obvious is irreparably flawed. As provided immediately above, Hirata teaches away from **initially perfectly vertical LC molecules** and, furthermore, teaches away from applying an electric field to tilt the LC molecules **in a uniform direct that is away from the volume excluding member**. Additionally, Hirata's teachings "may result in the formation of disclination lines", which is the very problem the present invention avoids. Thus, reliance on the Hirata reference would destroy the intent, purpose or function of the invention as claimed, and, therefore, a *prima facie* case of obviousness including Hirata cannot be properly made.

Similarly, reliance on Colgan and the combination of the two references is equally flawed. Although Colgan features negative dielectric anisotropy, the preferred dielectric anisotropies of the two references are mutually exclusive, each having its own unique advantages and disadvantages. There simply is no motivation to combine the two.

Indeed, one skilled in the art would simply not try to apply negative dielectric anisotropy of Colgan to the TN system of Hirata because vertical alignment would completely disrupt the TN mode of the LCD device. Thus, such a combination would destroy the intent, purpose or function of the invention disclosed in the Hirata reference, which is not proper. Consequently, a *prima facie* case of obviousness cannot be properly made.

Colgan, likewise, teaches away from applying an electric field to tilt the LC molecules **in a uniform direct that is away from the volume excluding member** and Colgan also teaches forming ridges or trenches to pre-tilt the LC molecules to **eliminate a manufacturing rubbing step** used with alignment layers. One side of a substrate facing the LC layer is expressly subjected to "vertical alignment treatment" in claims 1 and 4. Thus, reliance on the Colgan reference would destroy the intent, purpose or function of the invention as claimed, and, therefore, a *prima facie* case of obviousness including Colgan cannot be properly made.

In summary, the Colgan and Hirata references address solutions to non-analogous problems. Each teaches away from the same element of the invention as claimed. The Colgan reference further teaches away from subjecting one of the substrates to a vertical alignment treatment and the Hirata references teaches a solution that would create rather than eliminate disclination. There is no motivation found in either reference to combine the teachings of each. Were that to happen, the intent, purpose or function of the other reference would be destroyed. Thus the Examiner has failed to establish a *prima facie* case of obviousness based on Hirata and Colgan.

Because claim 2 and claims 5 and 6 depend from claims 1 and 4, respectively, they also are not made obvious by the Hirata and Colgan references.

ISSUE 2

In his rejection of claims 7-14 under 35 U.S.C. §103(a), the Examiner relies on the combination of Hirata and Colgan for purportedly disclosing an LCD apparatus as discussed above in Issue 1 in which the LC molecules in the pixel portion are oriented in a vertical alignment when no voltage is applied. Detailed Action dated October 5, 2004, page 8; page 17. The Examiner, however, concedes that, Hirata and Colgan do not explicitly disclose that, when no voltage is applied, the LC molecules in a non-pixel portion are oriented in a uniaxial horizontal alignment and the LC molecules in a pixel portion are oriented in a vertical alignment. See, e.g., Id., page 8; page 18. Nevertheless, the Examiner relies on Numano for purportedly disclosing the use of polarized ultraviolet light to weaken the strength of the alignment layer in

the region between pixels, i.e., the non-pixel portion, to reduce cross talk and to allow for a higher aperture ratio. See, e.g., Id., page 9; page 18. More specifically, the Examiner asserts that, in Numano, ultraviolet rays are used to "weaken the strength of the alignment layer (reducing the vertical alignment to become more horizontal in alignment)" in the non-pixel portion.

Applying the first prong of the *Graham* test:

The deficiencies of the teachings of Colgan and Hirata references have been addressed in our discussion of Issue 1 above and will not be repeated here. Numano teaches LCDs and methods of manufacturing LCDs having alignment films 13 and intermediate alignment films 13a. The intermediate alignment film 13a

> is an alignment film for giving the distortions to the alignment of the liquid crystal molecule 14 of the liquid crystal layer. If the alignment film 13a is an alignment film for causing the disclination by giving the distortion to the alignment of the liquid crystal molecule 14 on the boundary to the other alignment film 13, it can be an intermediate alignment film based on any alignment means. It is generally preferable to be an alignment treatment different from that of the other region upon the alignment film or an alignment film having the surface shape different from that of the other region of the alignment film.
>
> * * *
>
> Although the liquid crystal molecule rises in the normal tilt direction according to the pretilt given by the alignment film in advance, the liquid crystal molecule rises in the tilt direction reverse to the pretilt by the compulsory alignment of the lateral electric field, thereby causing so-called reverse tilt region when the alignment film does not give any distortions to the liquid crystal molecule due to strong lateral electric field added to the liquid crystal molecule with the adjacent pixel space being narrow in the signal wiring.

Numano, col. 7, line 42 to col. 8, line 2 (Emphasis added). In short, the LC molecules in the pixel portion are provided a certain pretilt, e.g., polarized "in a direction corresponding to the light polarizing direction of the illuminating ultraviolet ray" and the LC molecules in the non-

pixel portion are provided with a reverse tilt, e.g., polarized "in a direction different from the first irradiation ". See, e.g., Id., col. 11, lines 42-57.

CLAIM 7 IS NOT MADE OBVIOUS BY HIRATA AND COLGAN, FURTHER IN VIEW OF NUMANO BECAUSE NONE OF THE REFERENCES TEACHES, MENTIONS OR SUGGESTS THAT THE LIQUID CRYSTAL MOLECULES ARE TILTED IN A UNIFORM DIRECTION FROM THE VOLUME EXCLUDING MEMBER DISPOSED ON A PORTION OF THE SIDE EDGE OF AN ELECTRODE TO AN OPPOSITE EDGE.

There is nothing in Numano, however, that teaches, mentions or suggests that at no voltage, the LC molecules in the pixel portion are vertically aligned (indeed, they are pretilted from the vertical) and the LC molecules in the non-pixel portion are oriented in a uniaxial horizontal alignment (indeed, they are merely "reverse tilted"). As cited above, the invention as claimed provides "a mode of switching which retains a substantially perfect vertical alignment in an initial state" that is preferred to one that "orients LC molecules with a pretilt angle of several degrees from a completely vertical alignment." See, e.g., Specification, page 38, line 15 to page 39, line 11 (Emphasis added). Numano teaches pretilting and reverse pretilting, which teaches away from a "substantially perfect vertical alignment" and "uniaxial horizontal alignment", respectively, that the present invention provides when no voltage is applied.

Because claims 8-14 depend from claim 7 they also are not made obvious by Hirata and Colgan, further in view of Numano.

CLAIM 7 IS NOT MADE OBVIOUS BY HIRATA AND COLGAN, FURTHER IN VIEW OF NUMANO BECAUSE THE TEACHINGS OF THE REFERENCES ARE SUCH THAT ONE SKILLED IN THE ART WOULD NOT HAVE COMBINED THE REFERENCES TO SOLVE THE PROBLEM ADDRESSED BY THE PRESENT INVENTION.

The Colgan reference teaches away from subjecting one of the substrates to a vertical alignment treatment; Hirata references teaches a solution that would create rather than eliminate disclination; and the Numano reference teaches initially tilting and pre-tilting LC molecules. There is no motivation found in any reference to combine the teachings of each. Even if one were to do

so, the teachings of any one of the three references would defeat the intent, purpose or function of the other references. Thus the Examiner has failed to establish a *prima facie* case of obviousness based on Hirata and Colgan in view of Numano.

Because claims 8-14 depend from claim 7 they also are not made obvious by Hirata and Colgan, further in view of Numano.

In short, it is respectfully submitted that, claims 7-14 are not made obvious by any of the cited references, and further, satisfy all of the requirements of 35 U.S.C. § 100, et seq., especially § 103(a). Accordingly, claims 7–14 are allowable. Moreover, it is respectfully submitted that the subject application is in condition for allowance. Early and favorable action is requested.

The Applicants believe that no additional fee is required for consideration of the within Preliminary Amendment. However, if for any reason the fee paid is inadequate or credit is owed for any excess fee paid, you are hereby authorized and requested to charge Deposit Account No. **04-1105**.

Respectfully submitted,

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